Two New Species of Chthoniid Pseudoscorpions from the Western United States[1]

(Arachnida : Chelonethida : Chthoniidae)

WILLIAM B. MUCHMORE
University of Rochester, Rochester, New York

Among the collections of the American Museum of Natural History have been found two new chthoniid pseudoscorpions which deserve to be described and discussed at this time. I wish to thank Dr. W. J. Gertsch for his courtesy in allowing me to examine these collections.

FAMILY CHTHONIIDAE Hansen
TRIBE CHTHONIINI Chamberlin
Genus CHTHONIUS C. Koch

Hesperochthonius Muchmore, new subgenus

J. C. Chamberlin described *Chthonius californicus* in 1929, and later (1949) published an extensive emended diagnosis. The species was placed in the subgenus *Ephippiochthonius* by Beier (1932), and this assignment was followed by Chamberlin, on the basis of the apparent depression in the dorsum of the chelal hand (see Chamberlin, 1949; fig. 1A, p. 3). Chamberlin at this time also pointed out that the tactile setae *ib* and *isb* appeared to be set in another smaller depression, but noted that "the chela in question was treated with KOH and may merely be slightly shrunken at this point." (1949, p. 4). In addition, Chamberlin indicated three characters in which *C. californicus* differs from *C.* (*E.*) *tetrachelatus* (Preyssler), namely:

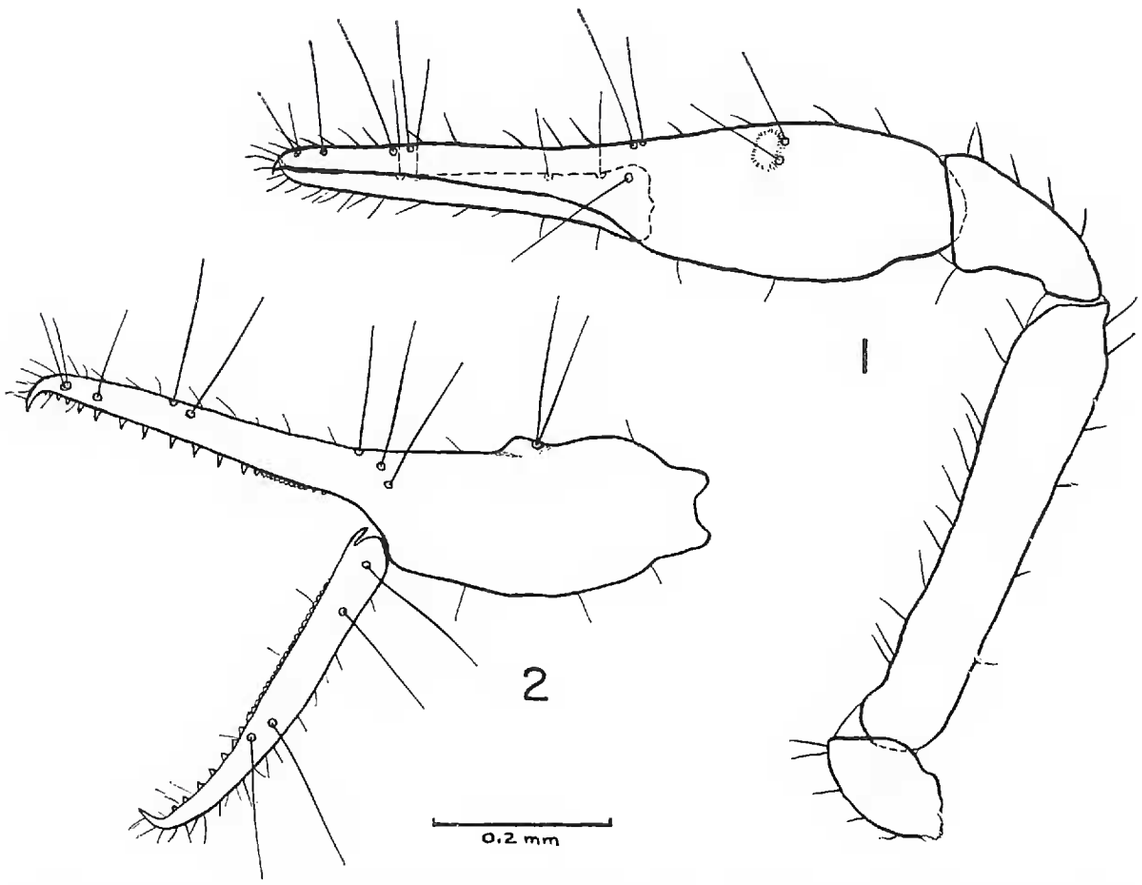
1) the possession of a row of small, rounded, contiguous teeth proximal to the large, spaced teeth on both the fixed and movable chelal fingers.

2) the hiatus in each row of internal, genital, guard setae so as to form two groups of two setae on each side.

3) the isolated sub-distal tooth on the movable finger of the chelicera (1949, fig. 1C, p. 3).

With the discovery of *Chthonius oregonicus*, n. sp., described below, it becomes apparent that this species and *C. californicus* are not to be included in the subgenus *Ephippiochthonius*, but should be assigned to a new subgenus, *Hesperochthonius*, which differs from the other subgenera of *Chthonius* in the characters listed above and in the unique chelal hand.

[1] This work was supported in part by a grant, GB5299, from the National Science Foundation.



FIGS. 1 and 2. *Chthonius* (*Hesperochthonius*) *oregonicus*, new species, holotype male. 1. Dorsal view of right palp. 2. Lateral view of left chela.

In whole and mounted specimens of *C. oregonicus* it can be seen clearly that the dorsum of the hand is only slightly and smoothly rounded as in the subgenus *Chthonius*, but that in addition there is a well-defined and moderate-sized conical elevation just about at the middle. Setae *ib* and *isb* are inserted side by side on the proximal side of the base of this elevation, in an "apparent depression" as noted by Chamberlin. In some views of the chela the elevation may not be seen in its entirety, and the impression is easily gained that the dorsum is depressed distal to the middorsal setae. Examination of the holotype and the allotype of *C. californicus* (in the Cornell University Collection) has confirmed that the chelal hand of this species is of the same configuration as described for *C. oregonicus*.

Chthonius (Hesperochthonius) oregonicus Muchmore, new species
(Figs. 1 and 2)

MATERIAL.—*Holotype male* (WM646.01002), allotype female (WM 646.01003) and paratype male from COOS HEAD, and two paratype females from Charleston, COOS COUNTY, OREGON; all specimens collected on 4 September 1947 by I. Newell.

DIAGNOSIS.—*Male:* (based on holotype and paratype, the latter in parentheses). General facies typical of the genus. Carapace about as long as broad; no epistome, but the anterior margin serrated in the medial half; surface reticulated dorsally and becoming scaly on the sides. Four well-devcloped eyes, of which the anterior pair are slightly larger than the posterior; the anterior eyes about one ocular diameter from the anterior carapacal margin and about one-half diameter from the posterior. Carapacal setae 4–6–4–2–2 = 18 (in the notation of Gabbutt and Vachon, 1963, p. 77). Coxal area typical; chaetotaxy mmm–3–0 : 2–2–cs : 2–4–cs : 2–4; each coxa II with a group of eight spines and coxa III with two to four spines; intercoxal tubercle with two small setae.

Abdomen typical. Tergal chaetotaxy 4 : 4 : 4 : 4 : 6 : 6 : 6 : 6 : 6 : 6 : 0. Anterior genital operculum with a group of three setae anteriorly, followed on each side by a group of two to four setae and with a row of four very small setae on each side of the hind margin; four internal, genital, guard setae on each side, but each row with a hiatus between the anterior pair and posterior pair (as described by Chamberlin, 1929, for *C. californicus*); posterior operculum with eight to nine setae on either side of the median opening, with a row of 12 setae along the hind margin and three guard setae associated with each stigma; fourth sternite with a row of eight setae and two guard setae on each side; more posterior sternites with seven to ten marginal setae, the lateral-most on segments 5, 6, and 7 being very small.

Chelicera noticeably shorter than carapace; palm with seven setae; fixed finger with a row of nine to eleven teeth of varied size; movable finger with a row of six to seven teeth of which the distal one is much the largest, and a conspicuous isolated tooth midway between the end of the row and the finger tip; galea represented by a prominent knob; serrula exterior with 14 plates; flagellum of nine or ten finely pinnate setae.

Palp characteristic of the subgenus; proportions of podomeres as shown in figure 1; tactile setae of chela shown in figure 2. The chela is generally similar to that of *C. tetrachelatus*, but without the dorsal depression characteristic of the subgenus *Ephippiochthonius*. Instead, the dorsal surface of the hand is smoothly and gently rounded, with the exception of a prominent conical elevation lying just distal to the tactile setae *isb* and *ib*. In lateral view, the curve of the distal face of this elevation may give the impression of an ephippiochthonian depression, but close examination of both lateral and dorsal aspects of the chela reveals that this is a fundamentally different structure. Fixed finger with 13–14 large, well-separated teeth distally, followed proximally by 12 small, rounded, contiguous teeth; movable finger with five or six large, spaced teeth and 21 small, contiguous teeth. Trochanter 1.8, femur 5.3 (5.5), tibia 2.1 (1.9), chela 4.4 (4.4), and hand 2.1 (2.1) times as long as broad; movable finger 1.23 (1.19) times as long as the hand.

Legs typical of the genus. Leg IV with tactile setae on tibia 0.56, on metatarsus 0.36, and on telotarsus 0.31 the length of the segment from the proximal end.

Female: (based on allotype and two paratypes, the latter in parentheses): Similar to male, but slightly larger. Carapacal setae of allotype 4–6–3–2–2 = 17, of paratypes 4–6–4–2–2 = 18. Coxal area as in male; coxa II with five to ten spines and coxa III with two to four spines.

Tergal chaetotaxy of abdomen as in male, with the exception that the first tergites of the two paratypes bear two and three setae rather than four. Sternal

chaetotaxy of allotype $\frac{3}{6}$: (3)11(3) : (2)8(2) : m7m : m6m : m4m : 6 : 7 : 7 : 0 : mm (paratypes similar).

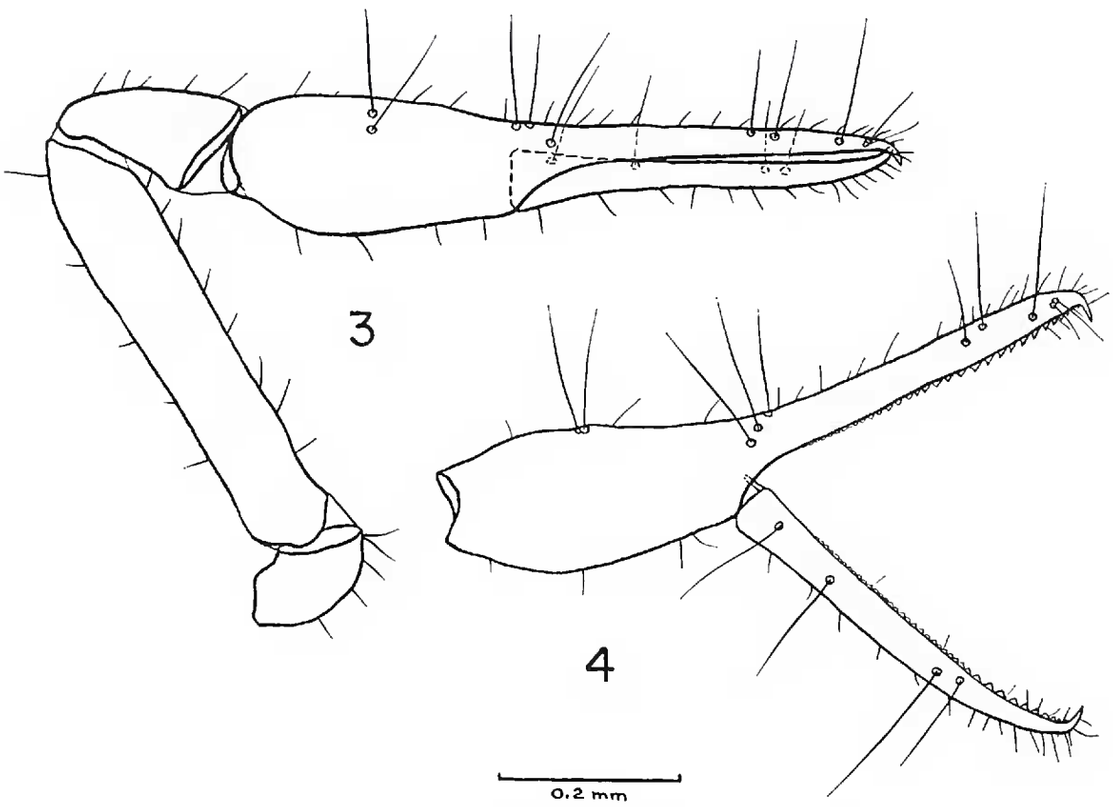
Chelicera and palp essentially as in male. Dorsal elevation on the chelal hand of same shape and in same position as described above. Fixed finger of chela with 12 (13–14) large, spaced teeth and 12 (11–14) small, contiguous teeth; movable finger with 6 (5–6) large, spaced teeth and 19 (18–20) small, contiguous teeth. Palpal trochanter 1.7 (1.5–1.7), femur 5.1 (5.3–5.5), tibia 1.9 (1.7–1.9), chela 4.0 (4.0) and hand 1.8 (1.8–1.9) times as long as broad; movable finger 1.15 (1.12–1.17) times as long as hand.

Legs similar to those of male. Leg IV with tactile setae on tibia 0.52, on metatarsus 0.34, and on telotarsus 0.32 the length of the segment from the proximal end.

MEASUREMENTS (in mm).—*Male:* Body length 1.48 (1.62); carapace 0.41 (0.43) long, ocular breadth 0.36 (0.41); abdomen 1.06 (1.20) long and 0.53 (0.68) wide. Chelicera 0.33 (0.33) long by 0.16 (0.16) broad; movable finger 0.18 (0.19) long. Palpal trochanter 0.16 (0.16) by 0.09 (0.09); femur 0.53 (0.52) by 0.10 (0.095); tibia 0.23 (0.23) by 0.11 (0.12); chela 0.75 (0.75) by 0.17 (0.17); hand 0.35 (0.36) by 0.17 (0.17); movable finger 0.43 (0.43) long; dorsal elevation on hand about 0.07 in diameter and 0.02 in height. Leg I: basifemur 0.32 (0.31) by 0.07 (0.07); telofemur 0.16 (0.15) by 0.07 (0.06); tibia 0.20 (0.19) by 0.05 (0.05); tarsus 0.33 (0.32) by 0.03 (0.04). Leg IV: entire femur 0.51 (0.50) long; basifemur 0.24 (0.24) by 0.21 (0.20); telofemur 0.33 (0.31) by 0.19 (0.19); tibia 0.33 (0.33) by 0.08 (0.08); metatarsus 0.19 (0.18) by 0.07 (0.07); telotarsus 0.35 (0.35) by 0.04 (0.04).

Female: Body length 2.13 (1.90–2.06); carapace (0.47–0.51) long, ocular breadth (0.36–0.41); abdomen 1.33 (1.36–1.53) by 0.80 (0.80). Chelicera 0.41 (0.37–0.41) long by (0.19–0.20) wide; movable finger 0.21 (0.20) long. Palpal trochanter 0.19 (0.17–0.20) by 0.11 (0.11–0.12); femur 0.61 (0.61–0.63) by 0.12 (0.11–0.12); tibia 0.25 (0.25) by 0.13 (0.13–0.15); chela 0.84 (0.84–0.88) by 0.21 (0.21–0.22); hand 0.41 (0.40–0.43) by 0.23 (0.22–0.23); movable finger 0.47 (0.47–0.48) long; dorsal elevation on hand about 0.07 in diameter and 0.02 in height. Leg I: basifemur 0.36 (0.36) by 0.08 (0.08); telofemur 0.17 (0.17) by 0.07 (0.07); tibia 0.21 (0.20–0.21) by 0.05 (0.05); tarsus 0.36 (0.36–0.37) by 0.04 (0.04). Leg IV: entire femur 0.59 (0.56–0.59); basifemur 0.28 (0.27–0.28) by 0.23 (0.23–0.24); telofemur 0.39 (0.36–0.37) by 0.20 (0.21–0.22); tibia 0.39 (0.37–0.40) by 0.09 (0.09); metatarsus 0.20 (0.20–0.21) by 0.07 (0.08); telotarsus 0.37 (0.39–0.40) by 0.04 (0.04).

REMARKS.—Since there is a noticeable sexual dimorphism in both *Chthonius californicus* and *C. oregonicus*, there is considerable overlap in the measurements and ratios for the two species. Nevertheless, comparing males and females separately, it is obvious that specimens of both sexes in *C. oregonicus* are significantly larger than those of the corresponding sex in *C. californicus* (cf. Chamberlin, 1949; p. 2–3). For instance, in *C. oregonicus* the carapace of the male is 0.41–0.43 mm and of the female 0.47–0.51 mm long, while in *C. californicus* the comparable measurements are 0.33–0.37 mm and 0.385–0.445 mm.



FIGS. 3 and 4. *Chthonius* (*Chthonius*) *pacificus*, new species, holotype female. 3. Dorsal view of left palp. 4. Lateral view of right chela.

The two known species of the subgenus *Hesperochthonius* can be separated by the following key:

Larger species—carapace of male more than 0.40 mm long, of female more than 0.46 mm; palpal femur of male more than 0.52 mm long, of female more than 0.60 mm ..... *C.* (*H.*) *oregonicus*, new species

Smaller species—carapace of male less than 0.38 mm long, of female less than 0.45 mm; palpal femur of male less than 0.48 mm long, of female less than 0.58 mm ..... *C.* (*H.*) *californicus* Chamberlin

Subgenus CHTHONIUS

Chthonius (Chthonius) pacificus Muchmore, new species

(Figs. 3 and 4)

MATERIAL.—*Holotype female* (WM620.01001) collected 20 March 1960 by W. J. Gertsch, *et al.* EAST OF SAN JUAN HOT SPRINGS, ORANGE COUNTY, CALIFORNIA (W 117°30′ : N 33°35′). No other specimens known.

DIAGNOSIS.—*Female:* With the general characteristics of the subgenus *Chthonius*. Carapace a little longer than broad, with a small, serrate epistome; surface nearly smooth dorsally but becoming finely reticulated on the sides. Four well-developed eyes of equal size, the anterior pair being about one ocular diameter from the anterior margin of the carapace, and the posterior pair about one-half diameter

behind the anterior. Carapacal setae 4–6–4–2–2 = 18. Coxal area typical; chaetotaxy mmm–3–0 : 2–3–cs : 2–3cs : 2–3(4); each coxa II with a group of seven or eight spines and each coxa III with three or four spines; intercoxal tubercle with two small setae.

Abdomen typical. Tergal chaetotaxy 4 : 4 : 4 : 4 : 6 : 6 : 6 : 6 : 6 : 6 : 6 : 0. Sternal chaetotaxy $\frac{3}{4}$: (4)10(4) : (2)8(2) : m7m : m5m : m4m : 6 : 6 : 8 : 0 : mm. Genital area typical.

Chelicera shorter than carapace; palm with seven setae; fixed finger with a row of nine teeth; movable finger with a row of seven teeth and an isolated tooth midway between the end of the row and the finger tip; galea represented by a distinct knob; serrula exterior with 14 blades; flagellum of eight finely branched setae.

Palp typical of the subgenus and quite similar to that of *Chthonius ischnocheles*, as described by Gabbutt and Vachon (1963, fig. 13, p. 80 and p. 81); proportions of podomeres as shown in fig. 3; tactile setae of chela as shown in fig. 4. Fixed finger with a row of 36 teeth, which are triangular and somewhat inclined toward the base and vary in size, with small close-set ones at the distal end, becoming larger and more widely-spaced in the distal third and then smaller, lower and contiguous toward the proximal end. Movable finger with 32 teeth, which in the distal half of the row are triangular and spaced but in the basal half are smaller, rounded and contiguous. Trochanter 1.6, femur 5.6, tibia 1.8, chela 5.0, and hand 2.1 times as long as broad; movable finger 1.40 times as long as hand.

Legs typical of the genus. Leg IV with tactile setae on tibia 0.53, on metatarsus 0.58, and on telotarsus 0.33 the length of the segment from the proximal end.

Male: Unknown.

MEASUREMENTS (in mm).—Female (holotype): Body length 1.66; carapace 0.40 long, ocular breadth 0.39; diameter of eyes 0.04. Abdomen 1.26 long and 0.67 wide. Chelicera 0.35 long by 0.17 broad; movable finger 0.17 long. Palpal trochanter 0.15 by 0.09; femur 0.50 by 0.09; tibia 0.20 by 0.11; chela 0.75 by 0.15; hand 0.32 by 0.15; movable finger 0.45 long. Leg I: basifemur 0.28 by 0.07; telofemur 0.13 by 0.05; tibia 0.17 by 0.04; tarsus 0.28 by 0.03. Leg IV: entire femur 0.44 long; basifemur 0.21 by 0.17; telofemur 0.28 by 0.16; tibia 0.28 by 0.07; metatarsus 0.16 by 0.05; telotarsus 0.27 by 0.03.

REMARKS.—While specimens of *Chthonius* (*C.*) *ischnocheles* (Hermann) have been collected at several places along the east coast of North America, the specimen described here is the first recorded representative of the subgenus *Chthonius* from the west coast. Inasmuch as *C.* (*C.*) *ischnocheles* and the other known members of the subgenus are native to Europe it might be supposed that the present specimen belongs to a population introduced in some manner into California. This possibility certainly exists, but seems unlikely for the following reasons: 1) the specimen does not conform closely to any known species (cf. Beier, 1963), and 2) inasmuch as other, related, and apparently indigenous, chthoniids occur on the west coast (i.e. *Chthonius califor-*

nicus, C. oregonicus, and three species of *Kewochthonius*), it is not unreasonable to expect this species as well to be indigenous.

Chthonius (*C.*) *pacificus* resembles other members of the subgenus in most respects, but can be distinguished by the following combination of characters:

1) eighteen carapacal setae, of which two are at the posterior margin.
2) epistome small but distinct.
3) eyes of equal size and about one-half ocular diameter apart; anterior eyes little more than one diameter from the anterior margin.
4) movable finger of the chela 1.4 times as long as hand.

Literature Cited

Beier, M. 1932. Pseudoscorpionidea. I. Chthoniinea et Neobisiinea. Tierreich, 57: 1–258.

1963. Ordnung Pseudoscorpionidea. Bestimmungs-bücher zur Bodenfauna Europas. Lief., I: 1–313.

Chamberlin, J. C. 1929. A synoptic classification of the false scorpions or chela-spinners, with a report on a cosmopolitan collection of the same—Part I. The Heterosphyronida. Ann. Mag. Nat. Hist., Ser. 10, vol. 4: 50–80.

1949. New and little known false scorpions from various parts of the world, with notes on structural abnormalities in two species. Amer. Mus. Novitates, 1430: 1–57.

Gabbutt, P. D. and Vachon, M. 1963. The external morphology and life history of the pseudoscorpion *Chthonius ischnocheles* (Hermann). Proc. Zool. Soc. Lond., 140: 75–98.

ZOOLOGICAL NOMENCLATURE: Announcement A. (n. s.) 80

Required six-month's notice is given on the possible use of plenary powers by the International Commission on Zoological Nomenclature in connection with the following names listed by case number:

(see, *Bull. zool. Nomencl.* 24, pt. 5, 7 December 1967):

1801. Suppression of *Argynnis chlorodippe* Villers & Guenée, 1835 (Insecta, Lepidoptera)
1815. Validation of *Pachyrhynchus* Germar, 1824 (Insecta, Coleoptera)
1822. Type-species for *Lasioptera* Meigen, 1818 (Insecta, Diptera)
1829. Suppression of *Polanisa* Walker, 1875 (Insecta, Hymenoptera)

(see, *Bull. zool. Nomencl.* 24, pt. 6, 18 January 1968):

1827. Type-species for *Solenius* Lepeletier & Brullé, 1834 (Insecta, Hymenoptera)

Comments should be sent in duplicate, citing case number, to the Secretary, International Commission on Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London S.W. 7, England. Those received early enough will be published in the *Bulletin of Zoological Nomenclature.*—W. E. China, *Acting Secretary to the International Commission on Zoological Nomenclature.*